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New experimental data on the viscosity of liquid toluene along the saturation line have been obtained recently, mostly at low temperatures. The quality of the data is such that recommended value can be proposed with improved uncertainties, for 210 K$<T<$400 K. A discussion on the uncertainties in the measurements and on the purity of the samples is made. The proposed value for the viscosity of liquid toluene at 298.15 K and 0.1 MPa is η=554.2$\pm$3.3 μ Pa s.

A simple formulation is developed for the accurate estimation of flash points of miscible combustible solvent blends. This formulation consists of an equation, previously validated for pure compounds. It is shown that the procedure described allows accurate estimations for ideal and nonideal binary and ternary mixtures.

A semi-theoretical approach for the ionization constant of water, K_w, is used to fit the available experimental data over wide ranges of density and temperature. The proposed model was found to be correct at the zero-density limit. The final formulation has a simple analytical form, includes seven adjustable parameters, and provides good fitting of the collected K_w data, within experimental uncertainties, for a temperature range of 0 °C to 800 °C and densities of 0–1.2 g cm^{-3}.

Cross section data have been compiled for electronic collisions with nitrogen molecules. Cross sections are collected and reviewed for: total scattering, elastic scattering, momentum transfer, excitations of rotational, vibrational, and electronic states, dissociation ionization, and emission of radiation. Recommended values for the cross section are presented.

A new parameterization of the Laidler method for estimation of atomization enthalpies and standard enthalpies of formation at 298.15 K for several families of hydrocarbons (alkanes, alkenes, alkynes, polyenes, poly-ynes, alkyl radicals, cycloalkanes, cycloalkenes, benzene derivatives, and polyaromatics) is presented. A total of 200 compounds (164 for liquid phase) are used for the calculation of the parameters.

Wood is a complex and nonuniform material. Its overall solubility is a combination of the individual components' ability to come into contact with the specified solvent (e.g., acetone) or blend. The components extracted from wood with a specified solvent represent the solubility of wood in that solvent at the condition described. Some wood compounds are soluble in water and organic solvents but the integral part of the cellular structure cannot be removed by common solvents at ambient temperature. High severities are needed for increased solubility/liquefaction due to temperature, time, and catalytic effects.

The mutual solubility and related liquid–liquid equilibrium of C_{10} hydrocarbons with water are exhaustively and critically reviewed. Reports of experimental determination of solubility in 20 chemically distinct binary systems are compiled. For ten systems, sufficient data are available to allow critical evaluation.

The mutual solubility and related liquid–liquid equilibrium of C_{11} and C_{12} hydrocarbons with water and heavy water are exhaustively and critically reviewed. Reports of experimental determination of solubility in 24 chemically distinct binary systems are compiled. For 12 systems sufficient data are available to allow critical evaluation. In addition, a new method based on the evaluation of the all experimental data for a given series of aliphatic and aromatic hydrocarbons was used.

A new formulation for the thermodynamic properties of the fluid phase of ethane in the form of a fundamental equation explicit in the Helmholtz energy is presented. The functional form of the residual part was developed using state-of-the-art linear and nonlinear optimization algorithms. In addition to the fundamental equation, independent equations for the vapor pressure, the saturated-liquid and saturated-vapor densities, and the melting pressure are given. Tables of thermodynamic properties calculated from the new formulation are listed in the Appendix.

New theoretical electron impact cross sections at typical etching plasma energies (sub 10 eV) are presented for the CF_x ($x=1-3$) active radical species in a form suitable for plasma modeling. The available experimental and theoretical data are summarized for two potential feed gases, CF_3I and C_2F_4. This data covers recommended cross sections for electron scattering, electron impact dissociation, and dissociative electron attachment, wherever possible.

The available experimental data for the density and viscosity of liquid aluminum and iron have been critically examined with the intention of establishing a density and a viscosity standard. The proposed standard reference correlations for the density of the aluminum and iron are characterized by standard deviations of 0.65% and 0.77% at the 95% confidence level, respectively. The overall uncertainty in the absolute values of the density is estimated to be one of $\pm$0.7% for aluminum and 0.8% for iron.

Energy levels, with designations and uncertainties, have been compiled for the spectra of the neutral atom and all positive ions of rebidium (Z=37). Wavelengths with classifications, intensities, and transition probabilities are also tabulated. In addition, ground states and ionization energies are listed.

Energy levels, wavelengths, and transition probabilities of the first and second spectra of tungsten, W I and W II, have been compiled. Wavelengths of observed transitions and energy levels derived from those wavelengths have been obtained from a critical evaluation of the available literature. Measured transition probabilities for some of the observed transitions have been compiled from the published literature.